Essential Components for Math Instruction: Considerations for Students With Extensive Support Needs

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Mr. Zamble is an elementary special education teacher who teaches multiple subject areas, including math, to students with extensive support needs. He plans his math instruction to align to the wide range of math-related individualized education program (IEP) goals as well as his students' grade-level standards. Mr. Zamble knows that to best support his students' learning in math, he must pay attention to the concepts and skills he is teaching but also the math-specific instructional strategies and tools he uses to deliver instruction. Mr. Zamble recently joined an online professional learning community focused on the science of math to learn more. He dived into a new practice guide shared by the group that was based on research with students with math difficulties and learning disabilities. He felt proud he already used some of the practices discussed by the group, such as teaching key math terms and symbols, just with more intensive strategies, such as constant time delay but using the more intensive strategies his students with extensive support needs needed, such as constant time delay.

In this article, we aim to provide educators with tools to use objective evidence about how students learn math to teach their students who may need the most intensive and specially designed instruction (SDI). Students with moderate to severe intellectual disability, multiple disabilities, or an intellectual disability that is co-occurring with autism spectrum disorder or complex communication needs require extensive support in all areas of life, including academic learning (Jackson et al., 2008). The math skills targeted for students with extensive support needs (ESN) have necessarily changed and evolved (Spooner et al., 2019). Although numeracy skills remain critical, application of skills such as time and money have greatly changed. For example, telling time on an analogue clock is becoming more obsolete with the use of smartwatches and smartphones. Likewise, paying with cash has become a challenge in the pandemic when many places have become cashless, instead requiring the use of some type of card (e.g., prepaid reloadable credit card, debit card, or credit card). Furthermore, online purchasing renders traditional money skills (e.g., coin identification) less and less "functional." Making a purchase online not only involves comparing cost to budget to determine if there is enough money to make the purchase but also should include comparing prices and factoring in if shipping is free or at an additional cost. Thus, comparing quantities, adding/subtracting, and decision-making are necessary for acquired math skills to truly be "functional" in our current society.

Providing SDI for students with ESN in math requires tailoring the content, methods, and delivery of instruction to address their unique needs. Although there are not commonly accepted cognitive profiles in math for students with ESN, experts have outlined how physical and cognitive characteristics, such as working memory, executive functioning, literacy, numeracy, fine and gross motor skills, and gestalt thinking, impact math learning (Berch & Mazzocco, 2007). At the forefront of planning math lessons for students with ESN should be the student's communication and the application of principles of Universal Design for Learning (UDL) to ensure there are multiple methods for representing the mathematical content, for the students to engage with the content, and for the students to express their understanding (CAST, 2018). The use of assistive technology can help open pathways to learning and communicating about math concepts for students with ESN. One unique benefit of math is that a large majority of the responses can be demonstrated without the need for vocal or written communication, such as through the use of manipulatives or pointing to a response on a number line or 100 chart. Applications to real-world uses of mathematical concepts should also be emphasized in planning to ensure the content is meaningful and personally relevant.

Students with a range of ESN have shown that with SDI using evidence-based practices, they can acquire and generalize grade-level math skills (Root et al., 2021; Spooner et al., 2019). Research across a variety of math skills and concepts has shown that many of the strategies that are effective for students with or at risk for math disabilities, such as the concrete-representational-abstract framework and schema-based instruction, can be enhanced or intensified to be similarly effective for students with ESN (Peltier et al., 2020; Root et al., 2021). Incorporating identified evidence-based practices specific to teaching math to students with ESN (e.g., modified schema-based instruction, systematic instruction with feedback and error correction, task analytic instruction; Root et al., 2021; Spooner et al., 2019) is one way to intensify specially designed math instruction.

The purpose of this article is to demonstrate how the six strategies identified in the What Works Clearinghouse Essential Components of Math Instruction Practice Guide (hereafter referred to as "the Practice Guide") as being effective for students with or at risk for mathematical difficulties and high-incidence disabilities (e.g., specific learning disabilities, emotional and behavioral disorders; Fuchs et al., 2021) can be effective for students with ESN when paired with additional empirically based strategies that we know work for students with ESN, such as those depicted in ***Figure 1***. We aim to point out unique considerations for students with ESN that must be made for instruction to be meaningful and accessible and result in meaningful learning.

Systematic Selection, Sequence, and Delivery of Instruction

Systematic instruction was defined in the Practice Guide as "instructional elements that intentionally build students' knowledge over time towards the intended learning outcomes" and "an

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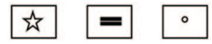
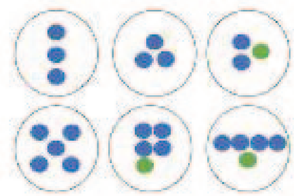
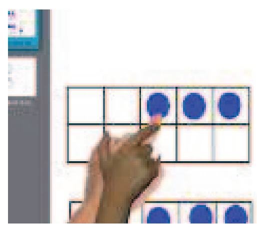
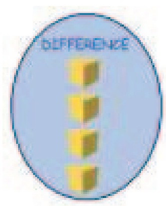
Figure 1 Examples of using stimulus and response prompting procedures in math

Procedure	Examples in Math
Constant Time Delay: A controlling prompt is delivered after a delay interval (0 seconds during initial instruction) and larger increment(s) during later instruction, naturally faded as learner begins to answer correctly before the delivery of the prompt.	**All trials:** Present target symbol (degree) and distractors (star and equals sign)  **<u>First: Teaching Trials (0s delay)</u>** 1.Give instructional cue **"Show me degree"** and immediately point to target 2. Provide specific feedback when student points to symbol. Say **"Yes, this is degree. Degree is the measure of the size of an angle"** *Student should not have an opportunity for an incorrect response* **<u>Then: Probe Trials (4s delay)</u>** 1.Give instructional cue **"Show me degree"** and wait 4s before prompting 2.Provide *contingent* feedback ✚ If **correct**: Praise and give specific feedback ⊘ If **no response:** Prompt, praise for waiting. ━ If **Incorrect:** Prompt to correct answer
Simultaneous Prompting: Probe trials occur before teaching trials to determine when acquisition has occurred. No error correction is provided in the probe trial. Teaching trials consist of providing a controlling prompt and 0-second delay interval (i.e., immediately telling/showing student correct answer)	**<u>First: Probe Trial(s)</u>:** Show one dot plate. Say **"How many?"** Wait for student respons[e] Do not give error correction or confirmation feedback. Quickly show next plate. Repeat until all plates have been shown. **<u>Then: Teaching Trial(s):</u>** Show one dot plate. Say **"This is 3. Say 3"**. Wait for student response. Quickly show next plate and repeat. 
Graduated Guidance: Physically prompting student through motoric, chained task (e.g., using virtual manipulatives on an iPad). Physical prompting is gradually faded until student completes task independently without physical support.	Give student physical support to swipe, drag, or double tap virtual manipulatives. For example, begin with hand-under-hand (pictured), then move to hand-under-wrist, hand-under-elbow, etc. 
System of Least Prompts: Student is given opportunity to independently perform skill before prompts are provided. Prompts follow a hierarchy of less assistance to most assistance ending in controlling prompt. Prompts are naturally faded as learner gains independence.	**<u>Example Hierarchy</u>** **1. Verbal (Say what):** Say **"Count the difference"** **2. Specific Verbal (Say how):** Say **"Count all the cubes in the difference circle"** **3. Model (Show how):** Say **"Watch me count the cubes in the difference circle. 1, 2, 3, 4. Now you do it."** Wait for student to repeat. **4. Physical (Hand-under-hand)**: **"Let's count the cubes in the difference circle together"**. Use hand-under-hand assistance to touch each cube as it is counted. 
Most to Least Prompts: Student is initially provided with most intensive level of assistance. Assistance is faded over time as student gains independence. Particularly helpful for tasks that are frustrating if learner doesn't have motor skill in their repertoire.	**<u>Example Hierarchy</u>** **1. Physical (Hand-under-hand):** Use hand-under-hand assistance to press correct button(s) on calculator **2. Gesture (Point):** Point to correct button(s) on calculator as student presses **3. Verbal (Say how):** State which button to press on calculator 

overarching set of instructional features that form the backbone of effective, systematic interventions" (Fuchs et al., 2021, p. 5). Systematic design applies to the selection and sequencing of content as well as the delivery. Just as recommended for students with or at risk for learning disabilities, sequencing instruction in increments and using accessible numbers supports acquisition of new skills and previously learned material should be integrated and reviewed frequently to support maintenance and generalization (Jimenez et al., 2021). For example, using problems with products under 20 during initial stages of learning to represent multiplication using manipulatives may reduce counting errors while still allowing students with ESN to demonstrate conceptual understanding.

Systematic instruction is a consistently recommended strategy for students with ESN in math (Root et al., 2021; Spooner et al., 2019), specifically the systematic instructional strategies of stimulus and response prompting (Collins et al., 2018). Stimulus prompting refers to assistance added to the antecedent of a trial that increases the likelihood of the learner making a correct response. Examples include positional prompting—moving the item closer to the student or making adjustments to the material to make the target response more salient (e.g., highlighting, bolding, changing font, boxing in the target response). Response prompting strategies are prompts (e.g., gesture, verbal, model, physical) that are added after the presentation of the stimulus to help the learner and increase the likelihood of them making a correct response (i.e., system of least prompts, most-to-least prompting, constant and progressive time delay, and graduated guidance; Collins et al., 2018). ***Figure 1*** depicts examples of stimulus and response prompts applied in mathematics for learners with ESN.

Selecting a strategy is both task and student dependent. The most important aspect of using systematic prompting strategies is to fade the prompts as learners move from acquisition to fluency (Jimenez et al., 2021). The Practice Guide states "systematically designed interventions most often include a 'bundle' of practices used to build and support student learning strategically" (Fuchs et al., 2021, p. 5). As such, these stimulus and response prompting techniques can be used to intensify and individualize the Practice Guide's recommendations for using visual and verbal supports as well as supportive feedback.

"The most important aspect of using systematic prompting strategies is to fade the prompts as learners move from acquisition to fluency.

Focus on the Language of Math

Mathematical language, including vocabulary, terminology, and symbols, is critical for students' understanding of and communication about mathematical concepts. One of the greatest challenges for teachers with little preparation in this content area is modeling mathematical language with mathematical soundness, brevity, and consistency. This takes some preplanning and possibly some collaboration with general education teachers to ensure mathematical soundness. Two prior *TEACHING Exceptional Children* articles specifically target the language of math for elementary (Hughes et al., 2016) and secondary teachers (Powell et al., 2019).

First and foremost, consider "painting a picture" of the mathematical language for learners. Just like a word is an abstract representation of what it means (e.g., you read the word "volcano" but picture a mountain erupting with lava because you have seen pictures or videos of it), mathematical language also needs that illustration paired with it for students to acquire the language. There are several ways to do this—using concrete and semiconcrete representations. For example, a student may not understand concepts of "more" and "less" until quantities of objects are placed in front of them that visually show these concepts. Likewise, students may need the concepts paired with meaningful representations. Using the prior example, a student who likes to purchase items may learn the concepts of "more" and "less" much faster using dollars rather than dots in a circle on a worksheet.

The next consideration is to pair familiar language with technical language to help students make connections—both when defining the term and when providing behavior-specific praise. For example, when teaching about "congruent figures," a student might sign "same" or state "they match!" Both of these responses have components that are true. By providing behavior-specific praise with their connection, as well as the technical definition, you are ensuring clear and consistent use of the mathematical language: "Yes, they do match—they are the same size and shape—'congruent.'"

Another option for teaching is to be explicit about when to apply or not apply correct mathematical terms to concepts—known as discrimination training or "example/nonexample" training. Graphic organizers can be particularly helpful with this. For example, if a student is working on discriminating between equations and expressions, a T-chart is a useful tool. This applies to numerous other mathematical concepts—sorting problems that require regrouping and those that do not, polygons and nonpolygons, two-dimensional and three-dimensional shapes.

Another graphic organizer recommended in the Practice Guide is a Frayer model (Fuchs et al., 2021). Frayer models have four quadrants with the term in the middle. A definition with mathematical soundness is provided in the upper left quadrant; characteristics of the concept are placed in the upper right quadrant, and this is a particularly good spot to put the connections to familiar but less formal terminology (e.g., stating a *cube* is like a *box*); examples are included in the lower left quadrant; and nonexamples are placed in the lower right quadrant. Students need to be explicitly taught how to use the Frayer model. Starting with the word, it may be easier to list examples and characteristics (upper right quadrant) before moving onto the definition. These

can then be posted as anchor charts in front of the classroom or placed in a math notebook for students to reference when needed, such as when participating in a general education class.

Additionally, the response prompting strategy previously mentioned—constant time delay (CTD)—is a quick and easy method for teaching vocabulary, including math symbols (Root & Browder, 2019). This can be done one-on-one or in a small group. As shown in ***Figure 1***, the prompt used in CTD is known as a "controlling prompt," and it is essentially the targeted response you want the student to perform. For example, if there are four math symbols laying in an array in front of the student and the student speaks, the controlling prompt would be to touch the target symbol and say its name (e.g., "plus"). Likewise, if the student uses an augmentative and alternative communication (AAC) device, the controlling prompt would be to select the symbol on the device. CTD can be used for both receptive tasks (e.g., "Show me the symbol, 'degree'"; or "Which symbol is used to describe temperature?") or expressive tasks (e.g., pointing to the symbol and asking, "What symbol?").

There are two rounds in CTD— the 0-second delay round and the delay round. The difference between these two rounds is that during the 0-second delay round, the controlling prompt is delivered immediately because the goal is nearly errorless learning. In other words, after the instructional cue is given (e.g., "Which symbol is used to describe temperature?"), you immediately model the target response and wait for the student to mimic that response (e.g., point to the degree symbol and say "degree."). The response items are shuffled between each trial within a round. After a predetermined number of trials at the 0-second round or when the student starts "anticipating responses" (i.e., moving to respond almost as immediately as your delivery of the controlling prompt), you can progress to the delay round. The amount of wait time in a delay round between the delivery of the instructional cue and the delivery of the controlling prompt is dependent on the student's response time. To test it out, use a familiar cue and response the student can do independently (e.g., "Show me your name") and see how long it takes the student to process and respond. For a brand-new skill, add 1 to 2 seconds, and this will be the wait time between the delivery of the instructional cue and the controlling prompt. Generally, 2 to 5 seconds is used, but it should be consistent for that student (e.g., 4 seconds). For a math-specific example, see Table 1. One final consideration is to pair definitions of terminology in the 0-second delay round to help with understanding of concepts. For example, using the same degree-symbol identification task, point to the degree symbol and say, "This is degree. When describing weather, degree is used to describe the temperature."

Use Multiple Representations

Using well-chosen multiple representations (e.g., concrete, pictorial/semiconcrete, and abstract) is critical to supporting students' integrated learning of math concepts and procedures (Fuchs et al., 2021). Manipulative-based instructional sequences such as Concrete/Virtual-Representation-Abstract (C/VRA) use a graduated sequence of instruction to first teach students to use manipulatives (concrete or virtual), then representations (e.g., drawings), and final abstract methods (e.g., algorithms, math facts) to gain conceptual and procedural understanding of math (Bouck & Long, 2021). The CRA/VRA instructional sequence incorporates practices Spooner et al. (2019) identified as evidence-based for students with ESN, including explicit instruction and manipulatives. The importance of well-chosen multiple representations does not diminish as students progress through grade levels and math topics. For example, base-10 blocks support understanding of place value and appropriately support concepts such as addition and subtraction, whereas Cuisenaire rods can effectively represent fractions and division. There is a deep body of research on the effectiveness of manipulative-based instructional sequences for students with ESN across math skills (Bouck & Long, 2021).

Yet the early numeracy skills of students with ESN may prevent independence in using representations as thinking tools. Building up critical skills such as rote counting, counting with one-to-one correspondence, and making sets should be instructional priorities for all students. At the same time, it is important to not set artificial or unnecessary prerequisites to grade-aligned math instruction or use of representations. For example, number identification is not a prerequisite skill for counting with one-to-one correspondence or making sets and can be developed alongside these other skills rather than waiting for students to be "ready for" them.

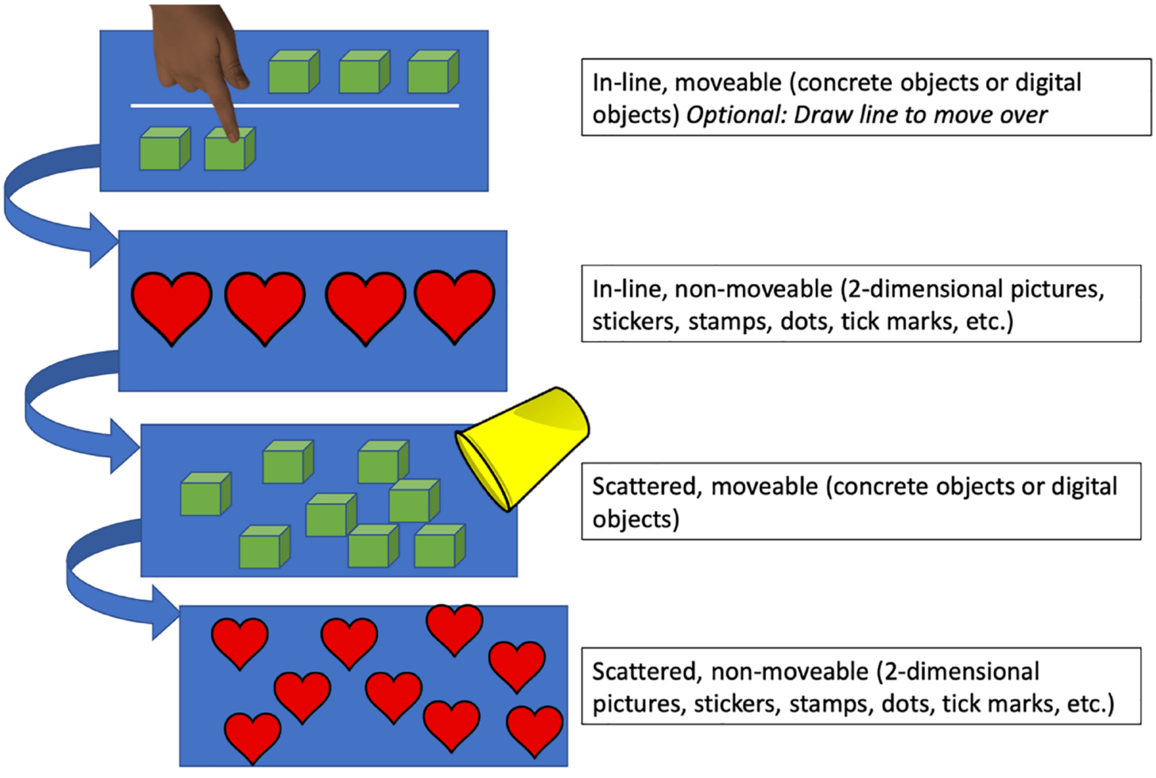
Students with ESN may need an intentional instructional sequence to support development of visual-organization skills needed to independently count with one-to-one correspondence as outlined by Browder et al. (2012). Their four-level scaffolded sequence begins with teaching students to count one to five scattered, movable objects across a line. Once they are successful with scattered movable objects in a line, teachers can move to using nonmovable two-dimensional representations in a line, followed by scattered movable objects, and finally scattered, nonmovable, two-dimensional representations. This teaching sequence is outlined in ***Figure 2***. Students who consistently need visual organization support in making sets can use jigs such as 10-frames or ice cube trays to reduce barriers and frustration. Within this teaching sequence, students may benefit from a systematic response prompting strategy such as graduated guidance or system of least prompts, as shown in ***Figure 1***.

Use Number Lines

Number lines in math education support students' learning of numbers themselves,

> **At the same time, it is important to not set artificial or unnecessary prerequisites to grade-aligned math instruction or use of representations.**

Figure 2 **Scaffolded support for visual organization skills**



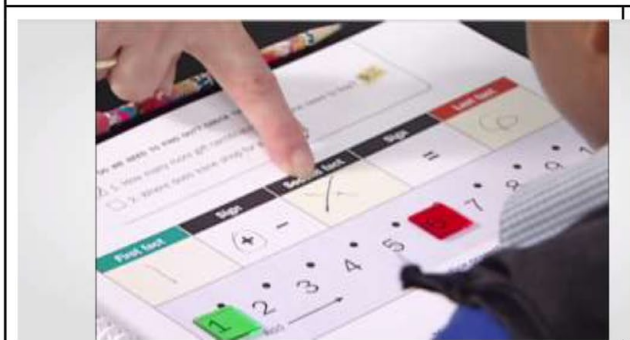
such as magnitude and place value, but also provide support for learning mathematical concepts and procedures. For students with ESN, number lines have often been used as a visual tool to identify numerals, count, and count on (Secada et al., 1983). Many students with ESN have complex communication needs, meaning they have significant speech and/or language impairments and often cannot rely on spoken language alone to effectively communicate. This means that even if individuals have some degree of speech, they may have difficulty with comprehension and/or expressing themselves. In academic instruction, this means practitioners must proactively plan multiple ways for students to "show what they know."

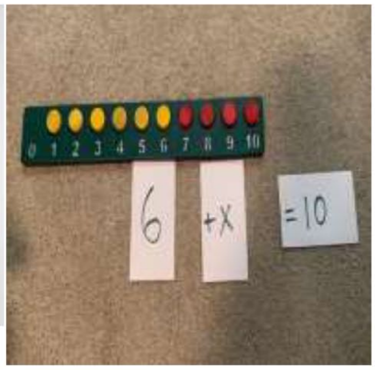
When planning for math instruction, an important first step is to identify the kinds of support students may use to help them access the general curriculum and achieve grade-level standards. Number lines are one math tool that can be used to create a communication response across multiple math skills. For example, a small number line placed on a student's desk, within a math notebook, or digitally available via an AAC device may provide a student with a commonly used tool generalizable across settings and math units. Similarly, within lessons students can communicate their math understanding by saying, pointing, placing a marker over the numeral, or removing the numeral on a Velcro number line to solve problems. Even for students who are just learning numerals and the magnitude of each symbol, a number line can provide support to build the concepts of "more/less." For example, when learning to calculate perimeter of a rectangle, unifix cubes can be placed on a number line on the "next numeral" (placing one cube on each number, stopping on 7, then placing the numeral 7 in the equation) to match the total length (e.g., 7 cubes) and then placing the numeral 7 in the equation $P = (L + W) \times 2$ for L (length).

Adaptations to math materials are common when planning for students with ESN. ***Figure 3*** provides examples of ways in which number lines may be developed to enhance student understanding of complex concepts, such as data analysis and algebraic equations. Number lines support the early numeracy skill building of whole numbers (positive and negative numbers); however, they can also be embedded in grade-aligned math instruction to support more complex concepts like fractions and decimals. Students with ESN may still be building their early numeracy skills while learning these more advanced math skills. Concrete representations of number lines (see example jig in ***Figure 3***) are an effective way to support understanding of numbers and magnitude, not only in 1:1 correspondence but also addition, subtraction, and algebra problem solving. For example, while teaching fractions, a number line could be the visual math representation of equal parts to make a whole (number). The number line would include marks in between each whole number, and fraction tiles (manipulatives) could be used to build each whole number. For example, two ½ are placed on the number line to make 1. Similarly, four ½ tiles are placed on the number line to make 2 wholes. Overtime, a ½ fraction tile could be replaced with a ½ circle for generalization and allow students to demonstrate their conceptual

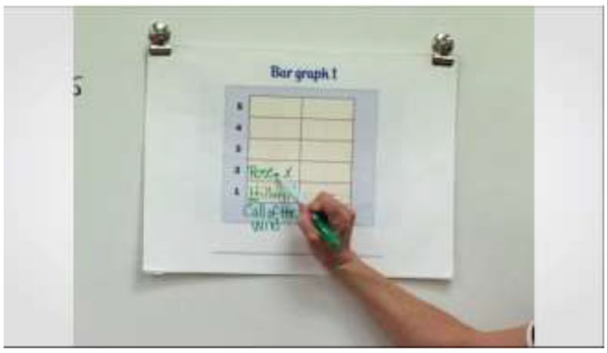
Figure 3 **Adaptations and supports**

Algebra: use of number lines, jig, and stimulus prompts (with colored markers to indicate left to right)

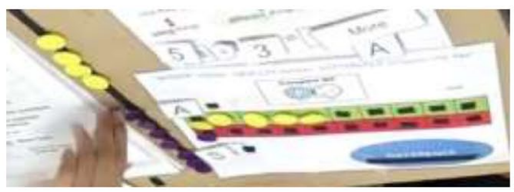




Data Analysis: show units using vertical number path (e.g., increasing number of votes)



Word Problems: Graphic organizers (schematic diagrams) with color-coding that are big enough to allow students to use manipulatives on top, Velcro and response options to support fine-motor and literacy skills



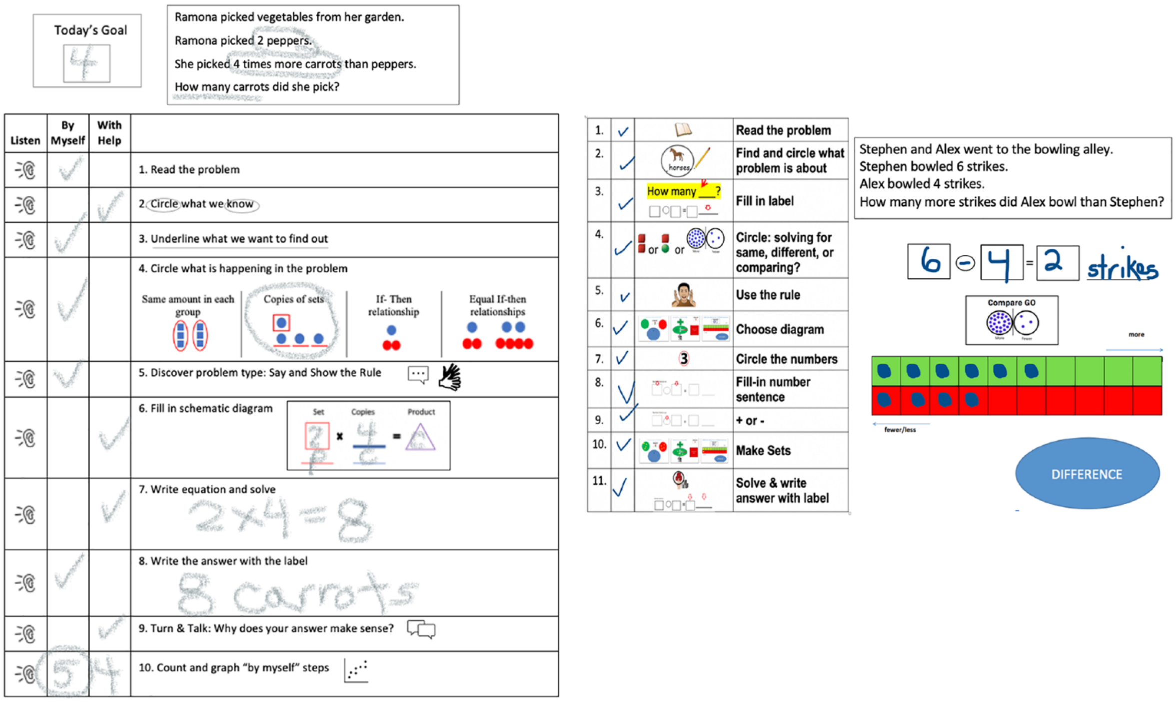
understanding. Using least to most prompts, students are provided only the supports they need to complete the task independently (e.g., nonspecific verbal—"Where does that tile go on the number line?"; specific verbal—"Put that tile on the number line next to the other tile."; model—"Put that ½ tile right here (model), next to the other ½ tile").

Although concrete examples are beneficial for students, semiconcrete or representations of number lines (e.g., coordinate grid, graph axis) should also be considered to build students' generalization of number lines used across math domains. Essentially, the same skills apply using a number line to count the total number of materials, adding fractions, or identify a coordinate on a coordinate plane using the x and y axes (e.g., {4, 2}; four spaces over and two spaces up), demonstrating the importance of the number line as an instructional support and as a skill, in and of itself, for students with ESN.

Build Fluency

Building fluency in math equates to being more accurate and efficient, which ultimately frees up cognitive space for students to do more complex problem solving. Often this is thought of as quick

Figure 4 **Example problem-solving routines using student-friendly task analysis**



Note. Left shows problem-solving routine for multiplicative comparison problem. Right shows problem-solving routine for comparison additive problem type and was adapted from "Schema-Based Instruction with Concrete and Virtual Manipulatives to Teach Problem Solving to Students With Autism," by J. R. Root, D. M. Browder, A. F. Saunders, and Y-y Lo, 2017, *Remedial and Special Education, 38*(1), 42–52, p. 45.

retrieval of math facts (addition, subtraction, multiplication, and division), which can be difficult for students with disabilities due to memory challenges. It is important to expand conceptualization of building fluency beyond simple memorization and recall of math facts, particularly for learners with ESN who may not have a strong foundation in number sense. Fluency requires some knowledge of strategies and conceptual understanding. The most essential and foundational skill is to fluently identify numerals and count, starting increments to 10, to 15, to 30, to 50, and to 100. Beyond counting, learners must conceptually understand quantities and relationships between numbers. Subitizing, or recognizing a quantity without counting, will help learners build fluency as well. Recognizing the quantity on dice or dominoes when playing a game, the number of fingers held up on hands, and on Dot Plates activities all help build subitizing, which in turn leads to more efficient addition using the counting on strategy (Jimenez & Saunders, 2019).

Other activities that build fluency through understanding of relationships include automatically being able to identify one more or one less than a numeral or quantity. For example, a student may draw a card from a deck of cards with face cards removed and quickly state one more and one less. Additionally, the use of 5 and 10 frames to teach composition of numbers to 10 and two 10-frames to teach 11 through 20 will help build fluency.

Simultaneous prompting—a response prompting strategy—is effective for building fluency and can be used with all of the suggested fluency activities. Essentially, simultaneous prompting is "test, then teach." The learner is shown a set of stimuli, such as cards or dot plates, and then given a specified amount of wait time to respond. The instructor sorts the cards or dot plates into two piles—correct and incorrect. After testing the learner, the teacher picks up some of the incorrect pile (e.g., 2–5) and then teaches the student (see example in ***Figure 1***). Simultaneous prompting is a form of systematic and explicit instruction that promotes high levels of student engagement and errorless learning and follows a routine with distributive and cumulative feedback (Collins et al., 2018).

Provide Word-Problem Instruction

We echo recommendations made by Powell et al. (in press) that problem-solving instruction should teach students to categorize problems by problem type (i.e., group/total, change, compare/difference; equal group, multiplicative comparison, ratio, proportion) as well as explicit instruction in a problem-solving routine. Students with ESN will likely need additional and intentional supports for working memory, language, communication, reading level, and numeracy beyond those required by students with or at risk for mathematical difficulties (Spooner et al., 2017). Furthermore, students with ESN need explicit and systematic instruction to not only learn how to procedurally solve problems but also to know when and why

to apply strategies (i.e., conceptual understanding) and generalize skills to real-world situations (Browder et al., 2018). Modified schema-based instruction (MSBI) is an evidence-based practice (Root et al., 2021) that explicitly teaches a problem-solving routine or attack strategy for solving word problems using flexible supports to address barriers in problem solving.

One area of problem-solving instruction that will likely need to be differentiated for students with ESN is the problem-solving routine or attack strategy. Mnemonic-reliant attack strategies (e.g., DISC, UPS-Check) may be difficult for students with limited literacy and memory skills because they may need the strategy broken down into more discrete steps and more support for independence and self-regulation. A more intensive support than a mnemonic would be a student-friendly task analysis that is used as a self-monitoring tool. ***Figure 4*** depicts two examples of MSBI problem-solving routines for multiplicative comparison and difference schemas. These task analyses can be differentiated based on the abilities and needs of the learner (McConomy et al., 2021). All problem-solving routines or attack strategies must begin with reading the problem, as shown in ***Figure 4***. For emerging readers, we recommended supporting self-advocacy at this step by having students request for problems to be read aloud in a form that makes sense for the students' communication preferences (e.g., sign, AAC, picture communication card, verbal request). Self-determination can be further supported by having students self-graph their progress (e.g., how many steps were completed independently correct, how many problems solved) and set goals for the next day (Gilley et al., 2021).

The cognitive and physical accessibility of instructional materials also need to be considered when planning word problem solving instruction (Root et al., in press). First, the problems themselves may need to be simplified by adjusting the reading level or removing extraneous information or quantities represented, especially when students are in the acquisition stage of learning. Spooner et al. (2017) provided recommendations for writing word problems across problem types that are cognitively accessible to students with ESN. Second, students with ESN will likely need schematic diagrams provided to them rather than being expected to draw or copy them on their own. Color coding can provide further support for conceptual understanding. If manipulatives are being used, schematic diagrams may need to be large enough for students to physically create sets on them.

Conclusion

When planning for and teaching math to students with ESN, educators will likely need to *bundle* practices to *systematically design interventions* (Fuchs et al., 2021). Using the research on how to teach math (e.g., the Practice Guide) paired with the evidence on teaching academics, including math, to students with ESN, educators can develop SDI that provides access not only to foundational numeracy skills but also grade-aligned math standards. Additionally, this "bundle" should include tools and strategies (e.g., number lines, word problems) students are able to use as thinking tools across math concepts to demonstrate skill acquisition, fluency, maintenance, and generalization.

One math goal for many of Mr. Zamble's students was to use a calculator for more complex calculations in the context of grade-aligned standards; however, most of his students had never used one before. Mr. Zamble decided to break down the steps using task analysis and teach his students using a most-to-least prompting system. This would allow him to provide more support while students were beginning to learn how to use a calculator, which he would then fade over time. He wanted to avoid the students becoming frustrated by repeatedly touching the wrong buttons and having to clear and start over several times. Mr. Zamble made a plan to design all math instruction built around problems with meaningful contexts (e.g., age-appropriate high-interest scenarios). He started to find a way to bring all of the research-based math practices together. Once a segmented approach to teaching math, now Mr. Zamble's math instruction is not only more effective but also easier to plan for and implement.

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